US-PAT-NO: 5443030

DOCUMENT-IDENTIFIER: US 5443030 A

TITLE: Crystallizing method of ferroelectric film

---------- KWIC ---------

Brief Summary Text - BSTX (5):

Since Pb in a film is likely to be drawn out in a **crystallizing** step in the ferroelectric film (including the Pb in accordance with the present invention), a cap layer is formed on the film surface. The Pb drawing out operation is restrained by a thermal processing operation so as to effect the **crystallizing** operation. The Pb drawing out operation in the film is further prevented effectively by the use of short hours' lamp heating in the thermal processing operation. Thus prepared, a delicate film can be realized with the crystal grain diameter being uniform. Typically, a **halogen arc lamp** having wide wavelengths from **infrared** rays to **ultraviolet** rays is used as a heating **lamp**. An oxygen gas used in the thermal processing atmosphere is cracked so as to cause atomic active oxygen for effectively preventing an oxygen deficiency in the film. The same effect can be obtained also with the use of the ozone gas. Also, a gas including Pb may be used in the **crystallizing** step.

Brief Summary Text - BSTX (25):

The oxygen atomic atmosphere can be formed, for example, as follows. A first method is effected by the irradiation of the **ultraviolet** rays into ozone or oxygen gas atmosphere. The ozone or oxygen gas atmosphere is composed of ozone or oxygen gas equivalent in quantity to the pressure of 10 through 50

Torr normally at 650.degree. C.

Brief Summary Text - BSTX (26):

The **ultraviolet** rays are desirably 185 nm or lower in wavelength. When the **ultraviolet** rays are irradiated upon the ozone gas as shown in the following equation, the O.sub.(1D) is caused. When the **ultraviolet** rays are irradiated upon the oxygen gas, the O.sub.(1D) is caused. ##STR1##

Claims Text - CLTX (19):

conducting a thermal heat treatment whereby the ferroelectric film is changed to have a perovskite type crystal structure, the thermal heat treatment being conducted in an oxygen atomic atmosphere, the oxygen atomic atmosphere being formed by irradiating ozone with **ultraviolet** rays.

Claims Text - CLTX (22):

12. The method of claim 9, wherein the **ultraviolet** rays have a wavelength not greater than 185 nm.

Claims Text - CLTX (25):

conducting a thermal heat treatment whereby the ferroelectric film is changed to have a perovskite type crystal structure, the thermal heat treatment being conducted in an oxygen atomic atmosphere, the oxygen atomic atmosphere being formed by irradiating ozone with **ultraviolet** rays having a wavelength not greater than 185 nm in order to form many crystal nuclei and to confine growth of crystal grain to a small diameter.

Claims Text - CLTX (27):

15. The method of claim 13, wherein the oxygen atomic atmosphere is formed

by irradiating ozone with **ultraviolet** rays having a wavelength not greater than 185 nm for one minute.